

## Printing in Samba 4.x

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# Printing

## 1 Current state

- New features of Samba 4.0

## 2 The new printing protocol

- Print System Asynchronous Remote Protocol (MS-PAR)
- Supporting MS-PAR in Samba



# Reporting bugs

[http://www.samba.org/~asn/reporting\\_samba\\_bugs.txt](http://www.samba.org/~asn/reporting_samba_bugs.txt)



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# We fixed the most important option

- `disable spoolss = true`



# What we have in 3.6 too

- Rewritten that the lanman/printing (RAP) code goes through spoolss
- spoolss uses the RPC winreg protocol to store all data now
- If you update from 3.5 to 3.6 or 4.x we automatically convert the printing tdb's
- net printing migrate encoding=CP1252  
ntprinters.tdb
- Improved Linux Printing Queue Daemon (lpqd)
- A lot of new spoolss tests



# Linux Printing Queue Daemon (lpqd)

Background task talking to the Linux printing system.

- The only process updating the printcap cache
- Notifies all other daemons about cache update when done
- Checks if there is a task pending every 60 seconds
- `printcap cache time = 1` will only run every 60 seconds



# The spoolss daemon (spoolssd)

```
ps afx -o pid,wchan=WIDE-WCHAN-COLUMN -o comm
```

```
17030 -          smbd
17032 -          \_ spoolssd-master
17033 -          \_ lpqd
17034 -          \_ spoolssd-child
17035 -          \_ spoolssd-child
17037 -          \_ spoolssd-child
17038 -          \_ spoolssd-child
17039 -          \_ spoolssd-child
```





# The spoolss daemon (spoolssd)

- master** simple daemon with small memory footprint
- master** only forks and kills childs serving the spoolss pipe
  - child** fully initialized idle daemon waiting to serve a connection
  - child** only answers spoolss request



## Enabling spoolssd

```
[global]
  rpc_server:spoolss = external
  rpc_daemon:spoolssd = fork
```



## Settings

- Minimum children to be preforked (default: 5)
- Maximum children to be preforked (default: 25)
- Spawn rate (default: 5)
- Maximum allowed clients (default: 100)
- Shortest lifetime of a child (default: 60 sec)



## spoolssd tuning variables

```
[global]
```

```
spoolssd:prefork_min_children = 1
```

```
spoolssd:prefork_max_children = 1
```

```
spoolssd:prefork_spawn_rate = 0
```

```
spoolssd:prefork_max_allowed_clients = 100
```

```
spoolssd:prefork_child_min_life = 0
```



## Minor things or other stuff

- The default directories for drivers are created by smbd now
- Fixed driver installation for Windows 8 (only driver version 3 is supported)
- There is also a LSA Service Daemon (lsasd) doing LSARPC, SAMR, NETLOGON



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## Why a new protocol?

Print System Remote Protocol (MS-RPRN) is still the core of printing in Windows. RPRN has several design limitations.

- Synchronous protocol
- Change notifications require print client to provide a print server as well



## New features of PAR

- Covers majority of RPRN functionality (72 methods (RPRN: 113 methods))
- Asynchronous DCE/RPC
- Inherits RPRN data messages and buffer formats
- Uses only ncacn\_ip\_tcp transport
- Usage of object\_ids at the DCE/RPC layer



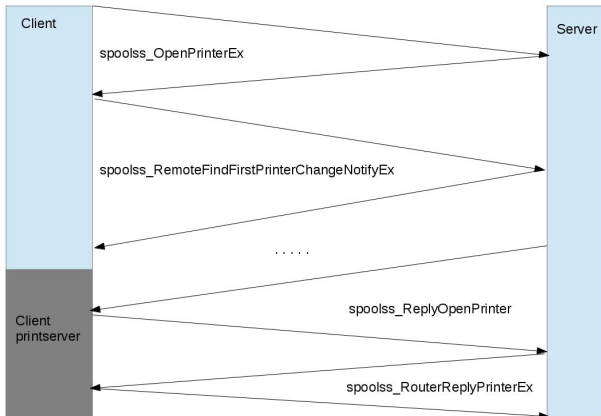


# Change Notifications in RPRN

- Client registers for change notifies
- Server opens new connection to the client for notifications
- Firewalls often forbid opening TCP/IP connections to desktops
- Anonymous access to spoolss pipe disabled by default
- When blocked, client needs to manually refresh / pull notifications



# Change Notifications in RPRN

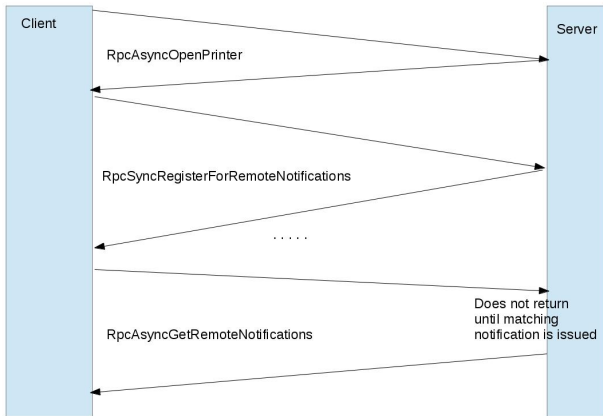


## Change Notifications in PAR

- Client registers for change notifies
- Client asks to receive change notifies, reply does not return until matching notification has been sent
- No printserver on the client needed



# Change Notifications in PAR



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# Client Prerequisites

- Both DCE/RPC client libraries support dynamic endpoints over ncacn\_ip\_tcp
- object\_ids are supported
- smbtorure/rpcclient testcode
- idea: PAR based print notification library



# Server Prerequisites

- Asynchronous DCE/RPC Server (currently only in the s4 RPC server)
- Endpointmapper with ncacn\_ip\_tcp transport
- PAR to RPRN redirection



## Questions & Answers

- Slides <http://www.samba.org/~asn/>

